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DIVISION 13 - SPECIAL CONSTRUCTION

SECTION 13703J

COMMERCIAL INTRUSION DETECTION SYSTEMS (IDS)

02/05

-- End of Section Table of Contents --

SECTION 13703J

COMMERCIAL INTRUSION DETECTION SYSTEMS (IDS)
02/05

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NOTE: This guide specification covers the requirements for intrusion detection systems (IDS) consisting of commercial equipment which is limited to a full range of interior point protection devices duress sensors, volumetric (space) protection sensors, simple exterior sensors limited to devices that can be hung on or attached to perimeter barriers, closed-circuit television (CCTV) for remote alarm assessment purposes, alarm signal data communications media, alarm reporting and monitoring systems, and basic card entry control systems. The CCTV system covered in this specification is not intended for exterior perimeter surveillance usage. System requirements must conform to NAVFAC DM-13.02. Consult the Engineering Field Division (EFD), Naval Facilities Engineering Command on questions concerning system design.
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NOTE: This revision "B" to NFGS-13703 amends the issue dated 30 June 1996 by updating references and adding Year 2000 Y2K Compliance.
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NOTE: The following information shall be shown on the project drawings:

1. Floor plans: Location of security devices, control units, alarm display equipment, and electrical power cabinets;

2. Site plan: Exterior devices and routing of conductors and conduit into building;

3. Single line type system riser diagram. Connection of equipment should be indicated for typical system chosen for cost estimating purposes;

4. Single line type electrical riser diagram; and

5. Mounting: Details for each device required for complete installation, including junction boxes for recessed BMS where required. Include device height and installation of wiring.

The device symbol presents an easy to use and

efficient means of identifying the essential features of the security engineering design effort. The symbol provides a method by which the phenomenology of the device, necessary identifying details related to the phenomenology of the device, and the means by which the device is positioned or mounted can be readily indicated on the engineering plans. The symbol also provides a means of identifying the device in order to develop accurate bills of material and system diagrams. The tables presented are suggested usage and can be modified as necessary to suit the particular design effort.

The "Completed Device Legend" is presented to illustrate actual devices and the legend detail needed on submitted plans.

DESIGN SYMBOLOGY

Note:

1. Device type: A single letter code used to indicate the phenomenology of the device. Refer to the device type list.

2. Device detail: A single letter code used to differentiate between similar type devices. Refer to the device detail list.

3. Mounting detail: A single letter code used to indicate the mounting means or positioning of the device. Refer to the mounting detail list.

4. Identifier: Can be any alphanumeric sequence which allows identification of individual device. Room number with alpha character is particularly effective for interior plans which have specific room numbers previously assigned.

5. Locator: Small 3 mm 3/32 inch dot which indicates the physical location of the device on the plans. Locator dot can be used with an arrow to indicate the location of directional devices, such as a CCTV camera, or with dashed lines to indicate fence mounted or buried line type devices. The symbol should be clarified in the legend and the plans.

6. Symbol: A 15 mm 1/2 inch or greater diameter circle with a horizontal line through the center. Can be changed to a square or hexagon of similar size, if necessary, for clarity on the drawings. The size is dictated by the height of letters used for the device nomenclature.

First Letter - Sensor Type (Phenomenology)

A	Acoustic
B	Balanced Magnetic Switch

First Letter - Sensor Type (Phenomenology)

C	Card Reader
D	Door Strike
E	Electrical Strain Sensitive
F	Fence Sensor
G	Glass Break
H	Reserved
J	Door Bolt
K	Capacitance
L	Photoelectric
M	Microwave
N	Radiation
P	Passive Infrared
R	Area Lighting
S	Switch (Contact)
T	Intercom
U	Ultrasonic
V	Video
W	Seismic (Vibration and Switchmat)
X	Ported Coaxial Cable
Y	Reserved
Z	Reserved

Second Letter - Sensor Detail

A	Ultracon
B	Intensified Silicon Intensified Target
C	Curtain
D	Vidicon
E	Angled left (_____) (radians) (degrees) ((_____) (radians) (degrees) from surface)
F	Reserved
G	Angled right (_____) (radians) (degrees) ((_____) (radians) (degrees) from surface)
H	Reserved
J	Reserved
K	Keypad
L	Long Range
M	Masked Coverage (Add Note to Legend & Spec for detail)
N	Reserved
P	Processor
R	Recessed
S	Surface
T	Transmitter
U	Receiver
V	Volume
W	Reserved
X	Reserved
Y	Reserved
Z	Reserved

Third Letter - Mounting Detail

A	Above Ceiling (above suspended ceiling)
B	Buried (Underground) (in pour or slab)
C	Ceiling Mounted
D	Duct Mounted

Third Letter - Mounting Detail

E	System Output to Control External Equipment
F	Flush Mounted
G	System Input From External Equipment
H	Header Mounted (above door opening)
J	Jamb Mounted (beside door opening)
K	Reserved
L	Reserved
M	Reserved
N	Reserved
P	Pole Mounted (i.e., exterior CCTV)
R	Recess Mounted
S	Surface Mounted
T	Table and Desk Mounted
U	Under Floor (below raised floor)
V	Reserved
W	Wall Mounted
X	Suspended
Y	Reserved
Z	Reserved

Completed Device Legend

ADT	X-Ray Unit Display Monitor, Desk Mounted
ADE	X-Ray Video Source
BRH	Balanced Magnetic Switch, Recess Mounted at Door Header
BSF	Balanced Magnetic Switch, Surface Mounted in Floor
BSH	Balanced Magnetic Switch, Surface Mounted at Door Header
BSP	Balanced Magnetic Switch, Surface Mounted on Post
BSJ	Balanced Magnetic Switch, Surface Mounted in Jamb of Door
CKP	Card Reader With Keypad, Post Mounted
CKW	Card Reader With Keypad, Wall Mounted
CM	Control Monitoring Unit
CS	Control Station Used With Ultrasonic Sensors
CPU	Central Processing Unit
CXP	Card Reader Without Keypad, Post Mounted
CXW	Card Reader Without Keypad, Wall Mounted
DRJ	Electric Door Strike, Recessed, Jamb Mounted
GYE	Ventilation System Butterfly Valve Output to Open Circuit in Equipment Supplied by Others
GYG	Ventilation System Butterfly Valve Input From Open Position Sensing Device
GZE	Ventilation System Butterfly Valve Output to Close Circuit in Equipment Supplied by Others
GZG	Ventilation System Butterfly Valve Input From Close Position Sensing Device
HYG	Ventilation System Blast Valve Input from Open Position Sensing Device
HZE	Ventilation System Blast Valve Output to Close Circuit
JSH	Door Bolt Locking Device, Surface Mounted at Door Header
LTW	Active Infrared Transmitter, Wall Mounted

Completed Device Legend

LUW	Active Infrared Receiver, Wall Mounted
MUS	Metal Detector, Surface Mounted
NUS	Radiation Detector, Surface Mounted
PCC	Passive Infrared, Curtain, Ceiling Mounted
PCW	Passive Infrared Sensor, Curtain Detection, Wall Mounted
PMW	Passive Infrared Sensor, Masked; Detection to Left, Wall Mounted
PNW	Passive Infrared Sensor, Masked; Detection to Right, Wall Mounted
PVW	Passive Infrared Sensor, Volume Detection, Wall Mounted
RYE	Area Lighting Output to Energize Circuit in Equipment Supplied by Others
SRF	Switch Contact, Recessed, Floor Mounted
SRH	Switch Contact, Recessed, Header Mounted
SWG	Uninterruptible Power Supply Status Input From Sensing Device
SYE	Output Contact to Energize Door Open Circuit in Equipment Supplied by Others
SZE	Output Contact to Energize Door Close Circuit in Equipment Supplied by Others
TJT	Audio Communication Transceiver, Table Top
TJW	Audio Communication Transceiver, Wall Mounted
UEW	Ultrasonic Sensor, Detection Angled Left 1.31 rad 75 Degrees (0.262 rad15 Degrees From Surface), Wall Mounted
UGW	Ultrasonic Sensor, Detection Angled Right 1.31 rad 75 Degrees (0.262 rad15 Degrees Surface), Wall Mounted
UVC	Ultrasonic Sensor, Volume Detection, Ceiling Mounted
UVW	Ultrasonic Sensor, Volume Detection, Wall Mounted
VAC	Video, Ultracon Camera, Ceiling Mounted
VAP	Video Ultracon Camera, Pedestal Mounted
VAW	Video, Ultracon Camera, Wall Mounted
VBP	Video, Isit Camera, Pole Mounted
VDX	Video, Display Monitor, Console Mounted
VOC	Video, Vidicon Camera, Ceiling Mount
WYG	Potable Water Isolation Valve Input From Open Position Sensing Device
WZW	Potable Water Isolation Valve Output to Close Circuit in Equipment Supplied by Others
XPB	Ported Coax, Data Processor, Mounted in Buried Vault Enclosure
XWW	Ported Coax, Data Control Interface Unit, Wall Mounted
YTT	Keypad Unit, Stand-Alone, Desk Mounted
ZTT	Personal Identity Verifier, Stand-Alone, Desk Mounted

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PART 1 GENERAL

1.1 REFERENCES

The publications listed below, current revision, form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C39.1	Electrical Analog Indicating Instruments

ASTM INTERNATIONAL (ASTM)

ASTM A 123/A 123M	(2002) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM B 32	(1996) Solder Metal

DIRECTOR OF CENTRAL INTELLIGENCE DIRECTIVES (DCID)

DCID 6/9	(2002) Physical Security Standards for Sensitive Compartmented Information Facilities

ELECTRONIC INDUSTRIES ALLIANCE (EIA)

ANSI/EIA/TIA-232-E	Interface Between Data Terminal Equipment and Data Circuit-Terminating Equipment Employing Serial Binary Data Interchange

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 2	Industrial Control and Systems Controllers, Contactors and Overlay Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC
NEMA ICS 6	Enclosures for Industrial Control and Systems

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2002) National Electrical Code

SOCIETY OF MOTION PICTURE & TELEVISION ENGINEERS (SMPTE)

SMPTE 170M	Television - Composite Analog Video Signal - NTSC for Studio Applications

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

47 CFR 15	Radio Frequency Devices

UNDERWRITERS LABORATORIES (UL)

UL 1037	Antitheft Alarms and Devices

UL 1076	Proprietary Burglar Alarm Units and Systems
UL 1610	Central-Station Burglar-Alarm Units
UL 294	Access Control System Units
UL 636	Holdup Alarm Units and Systems
UL 639	Intrusion-Detection Units
UL 681	Installation and Classification of Mercantile and Bank Burglar-Alarm Systems
UL 796	Printed Wiring Boards

1.2 DEFINITIONS

a. Active mode: That in which some type of signal is continuously sent across the link, resulting in simple link breaks being readily detected.

b. Fail-safe: The capability to monitor system functions and report an alarm when a failure is detected in a critical system function.

c. Installer: Either the Subcontractor or a Subtier with whom the Subcontractor has a firm contractual agreement.

d. Intruder: An animate object at least 1220 mm 48 inches in height, 34 kg 75 pounds in weight and 0.113 cubic meter 4 cubic feet in volume, moving through the protected zones or portals at a velocity of 30 to 3000 mm 0.1 to 10 feet per second.

e. Sensor zone: A geographic position for which an intrusion must be identified and displayed and may be the combination of multiple detection devices.

f. Element: As used in this section means a constituent part of a complex signal such as an ac or dc voltage or current, ac phase, or frequency duration.

g. Year 2000 compliant: Computer controlled facility components that accurately process date and time data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the twentieth and twenty-first centuries, and the years 1999 and leap year calculations.

1.3 SYSTEM DESCRIPTION

Modify existing intrusion detection system (IDS), including associated equipment and appurtenances. System design shall include supervising installation of rigid or flexible conduit for IDS as required during site preparation, running of system wires and cables, and system component installation, component testing, and system checkout. Each system shall be complete and ready for operation, and compliant with UL 639. Existing system was manufactured by Casi-Rusco, and new equipment shall be compatible with and operate accurately and reliably with the existing system. Include materials not normally furnished by the manufacturer with the IDS equipment.

1.4 SUBMITTALS

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NOTE: The "G" in submittal tags following each submittal item indicates Government approval and should be retained as long as a special reviewer is cited. Add "G" in submittal tags following any added submittals that are determined to require review by another organization and Governmental approval. Submittal items not designated with a "G" will be reviewed and approved by the CQC organization. If a special reviewer is cited, retain the second bracketed sentence.
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The following shall be submitted in accordance with Section 01330, "Submittal Procedures," in sufficient detail to show full compliance with the specification:

SD-02 Shop Drawings

IDS components

Overall system schematic

SD-03 Product Data

Interior point sensors

Interior volumetric sensors

Exterior fence sensors

Duress alarms

Access control subsystem

Card reader

Keypad

Communications cable

Microwave sensors

Radio frequency link communications systems

Communications interface devices

CCTV camera

CCTV lenses

Auxiliary CCTV camera equipment

Video switchers

Video monitors

Video tape recorder

Local annunciator unit

Control units

Printer

Uninterruptible power supply (UPS)

Batteries

Central alarm reporting display unit

[Color graphic] CRT displays

Fixed map display

Four quadrant multiplexer

SD-05 Design Data

Backup battery capacity calculations

Probability of system success calculations

SD-06 Test Reports

IDS operational test

IDS final test

SD-07 Certificates

IDS operational test plan

Installer's qualifications

Instructor's qualifications

Year 2000 (Y2K) Compliance Warranty

SD-10 Operation and Maintenance Data

IDS components, Data Package 5

IDS software, Data Package 1

Submit operation and maintenance data in accordance with Section 01781, "Operation and Maintenance Data" and Section 16050N, "Basic Electrical Materials and Methods."

1.5 QUALITY CONTROL

1.5.1 Evidence of Experience and Qualifications

Show that the installer who will perform the work has a minimum of 2 years experience successfully installing IDS of the same type and design as specified herein, and that he/she is factory certified on Picture Perfect

software. Include the names, locations, and points of contact of at least two installations of the same type and design as specified herein where the installer has installed such systems. Indicate the type of each system and certify that each system has performed satisfactorily in the manner intended for a period of not less than 12 months.

Subcontractor must submit complete Product Data, including, but not limited to:

Interior point sensors
Interior volumetric sensors
Exterior fence sensors
Duress alarms
Access control subsystem
Card reader
Keypad
Communications cable
Microwave sensors
Radio frequency link communications systems
Communications interface devices
CCTV camera
CCTV lenses
Auxiliary CCTV camera equipment
Video switchers
Video monitors
Video tape recorder
Local annunciator unit
Control units
Printer
Uninterruptible power supply (UPS)
Batteries
Central alarm reporting display unit
[Color graphic] CRT displays
Fixed map display
Four quadrant multiplexer

Subcontractor must submit complete Design Data, including, but not limited to:

Backup battery capacity calculations
Probability of system success calculations

1.5.2   Regulatory Requirements

Provide only UL listed IDS equipment except for exterior IDS sensors, access control compliant with UL 294, and closed-circuit television (CCTV) components compliant with SMPTE 170M.

PART 2   PRODUCTS

2.1   YEAR 2000 (Y2K) COMPLIANT PRODUCTS

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NOTE: To ensure that buildings' systems continue to function beyond Year 2000, the following paragraph must be included when this section is part of a construction contract. For more information on Y2K, see these web sites on the internet: http://www.doncio.navy.mil/y2k/year2000.htm, the

Year 2000 homepage of the Department of the Navy Chief Information Officer (DONCIO); http://www.itpolicy.gsa.gov/mks/year2000/legal.htm, the General Services Administration (GSA) Chief Information Officer (CIO) homepage for Y2K procurement, contracting, and legal issues: http://y2k.lmi.org/gsa/y2kproducts contains information on vendor product compliance.

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Provide computer controlled facility components, specified in this section, that are Year 2000 compliant (Y2K). Computer controlled facility components refers to software driven technology and embedded microchip technology. This includes, but is not limited to; basic automated access control, central alarm reporting and display unit, and other facilities control systems utilizing microcomputer, minicomputer, or programmable logic controllers

Shop Drawings shall include, but not be limited to:

IDS components
Overall system schematic

2.2 IDS SUBSYSTEMS

Provide a fully integrated IDS consisting of the following major subsystems some existing, some new:

a. Detection

b. Fiber Optic sensing

c. Communications (New)

e. Alarm reporting and display

f. Power (New)

2.3 INTEGRATED SYSTEM FUNCTIONAL REQUIREMENTS

Ensure that IDS is fully integrated with physical security and other elements of the overall facility security system. Provide specific subsystem compliant with UL 636, UL 639,DCID 6/9, 47 CFR 15 and consisting of the following:

a. Detection subsystem: Sensors or switches to detect intrusion attempts.

b. Specialized, laser fired optical fiber designed for use as an intrusion sensing element.

c. Communications subsystem: Elements required to ensure that pertinent data is transferred from point of origin to point where appropriate actions can be taken.

e. Alarm reporting and display subsystem: Electronic devices to control, process, integrate, and annunciate IDS data.

f. Power subsystem: Components required to ensure continuous

operation of the entire IDS.

2.4 INTEGRATED SYSTEM PERFORMANCE REQUIREMENTS

The installed and operating IDS shall be integrated into the overall facility to detect intrusion and shall perform as an entity, as specified below.

2.4.1 Detection Coverage

Provide and adjust sensors so that coverage is maximized without mutual interference.

2.4.2 Detection Resolution (Sensitivity)

Sensitivity shall be capable of the following:

a. Locating intrusions within zones along a line or perimeter;

b. Locating intrusions at individually protected assets or at an individual portal;

d. Locating failures or tampering at individual sensors.

2.4.3 Probability of System Success

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NOTE: For U.S. Navy facilities, minimum Ps is 0.9. Delete this paragraph for simple, non-high security systems. Use this paragraph when specific DoD and USN directives require a high level of performance, which is usually expressed as "probability of detection." See NAVFAC DM-13.02 for discussion of "probability of detection."

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Success shall be predicated on the proposed system architecture. Overall system probability of success shall be 0.99 minimum.

2.4.3.1 Other System Success Considerations

Prior to the commencement of any work, Subcontractor must submit the following to the Engineer of Record for review and approval:

Certificates:

IDS operational test plan
Installer's qualifications
Instructor's qualifications
Year 2000 (Y2K) Compliance Warranty

Operation and Maintenance Data:

IDS components, Data Package 5
IDS software, Data Package 1

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NOTE: Select the most restrictive choice(s) based upon the degree of IDS annunciation granularity

required.

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a. False alarm: An alarm which does not result from a valid intrusion by personnel, vehicles, other moving objects, or nuisances, but rather as a result of an internally generated sensor or other system component noise. The false alarm rate shall not exceed one per 180 days for each sensor zone.

b. Nuisance alarm: May result from sources external to the system which provide sensor stimuli similar to those of personnel, vehicles, or moving objects, such as wildlife and natural phenomena. Nuisance alarm rate is a function of sensor adjustment and shall not exceed a rate of one alarm per 14 days for each sensor zone for the initial 90 days after acceptance by the Contractor. Nuisance alarm rate shall not exceed a rate of one alarm per 30 days for each sensor zone thereafter.

c. Reliability and Availability: Reliability for IDS shall be based upon reliabilities of equipment used. Reliability requirements shall be as contained in equipment specifications, and when equipment is combined in particular configuration, shall provide a system-level mean-time-between-failure (MTBF) that is consistent with both the system-level availability requirement stated below and specific requirements for each defined functional area. Inherent availability required (Ai) is based on an assumption of no planned system downtime for preventive maintenance and shall be calculated as:

$$Ai = \frac{MTBF}{MTBF + MTTR}$$

Where MTBF is the mean-time-between-failure of the system as defined by:

$$\frac{1}{MTBF} = \sum_{j} \frac{1}{(MTBF)_j}$$

Where (MTBF)j is the achieved mean-time-between-failure of each individual piece of equipment used in the given system configuration as demonstrated in the individual equipment reliability qualification test.MTBF for this system shall be not less than 5000 hours.

2.4.4 Alarms

Alarms shall include but not be limited to the following:

a. Intrusion detection

b. Tamper switches

c. Fail-safe capability

e. Power loss detection

2.4.4.1 Intrusion Detection

Use existing fiber optic sensing elements and processors.

2.4.4.2 Tamper Switches

Enclosures, cabinets, housings, boxes, raceways, and fittings with hinged doors or removable covers which contain circuits of the intrusion detection system and associated power supplies shall be provided with cover having corrosion-resistant tamper switches. Arrange tamper switches to initiate an alarm signal when the door or cover is moved as little as 6 mm 1/4 inch from the normally closed position. Mechanically mount tamper switches to maximize defeat time when enclosure covers are opened or removed. Minimum amount of time required to depress or defeat the tamper switch after opening or removing the cover shall be one second. Enclosure and tamper switch shall prevent direct line of sight to internal components and prevent switch or circuit tampering. Conceal mounting hardware so switch cannot be observed from enclosure exterior. Covers of junction boxes provided to facilitate initial installation of the system need not be provided with tamper switches if covers contain no splices or connections. Tamper alarms shall be annunciated to be clearly distinguishable from intrusion detection alarms. Tamper switches shall be:

a. Inaccessible until switch is activated;

b. Under electrical supervision at all times, irrespective of the protection mode in which the circuit is operating;

c. Spring-loaded and held in the closed position by the door, magnetic, or cover protected;

d. Wired to break the circuit when the door or cover is disturbed;

e. Wired so that each sensor and device is annunciated by zone at the central reporting processor.

2.4.4.3 Fail-Safe Capability

Provide fail-safe capability in critical elements of the IDS. This shall include, but not be limited to, capability to monitor communication link integrity. When diminished functional capabilities are detected, system shall provide annunciation of the fault.

2.4.4.4 Line Fault Detection

As a minimum, fault isolation at the systems level shall have the same geographic resolution as provided for intrusion detection. Communication links of the IDS shall have an active mode for line fault detection. System shall be either a static, or dynamic system. In a static system, the "no-alarm" condition shall always be represented by the same signal, which shall be different than the signal originally transmitted. The dynamic system shall represent "no-alarm" with a signal which continually changes with time.

2.4.4.5 Power Loss Detection

Provide capability to detect when a critical component of the system experiences temporary or permanent loss of power and to declare an alarm. Alarm shall be annunciated to clearly identify the component experiencing power loss.

2.4.5 Electrical Power

2.4.5.1 Primary Power

At eight sites, primary power is provided by existing solar panels which provide approximately 50 watts of unregulated 12 volt DC power. The Subcontractor shall provide new batteries, solar regulators and enclosures and interconnect the power subsystem components as shown in the drawings.

2.4.5.2 Backup Power

Provide backup power to the primary power by backup battery in each element or subsystem as may be appropriate to provide a minimum of 24 hours of power.

2.5 SYSTEM PERFORMANCE REQUIREMENTS

Design system components to operate as described herein within the context of the overall system performance previously described. Perceived inconsistencies between the following component performance specifications and overall system level performance descriptions shall be decided in favor of the former.

2.5.1 Modularity

Provide components designed for modular increase or decrease of system capability by installation or removal of plug-in modules. Design system components to facilitate modular subassembly and part replacement.

2.5.2 Reliability

Provide only new components in current manufacturing production, manufactured to meet requirements specified herein, and free from characteristics and defects which affect appearance, or serviceability or render equipment unsuitable for the intended purpose. MTBF for component shall not be less than 5000 hours.

2.5.3 Maintainability

Components shall be capable of being maintained using commercially available standard tools and equipment. Components shall be arranged and assembled to be readily accessible to maintenance personnel without compromising defeat resistance of IDS.

2.5.4 Availability

Provide components designed for continuous operation. Provide solid-state electronic components, mounted on printed circuit boards conforming to UL 796. Boards shall be plug-in, quick-disconnect type. Circuitry shall not be so densely placed as to impede maintenance. Power-dissipating components shall incorporate safety margins of not less than 25 percent with respect to dissipation ratings, maximum voltages, and current-carrying capacity. Light duty relays and similar switching devices shall be solid-state type or hermetically sealed electromechanical. Electrical indicating instruments incorporated into system components shall conform to applicable provisions of ANSI C39.1.

2.5.5 Environmental Conditions

2.5.5.1 Interior Conditions

Equipment installed in environmentally protected interior areas shall meet performance requirements specified for the following ambient conditions:

a. Temperature: 0 to 50 degrees C 32 to 120 degrees F. Components installed in unheated security protected areas shall meet performance requirements for temperatures as low as minus 17 degrees C zero degrees F;

b. Pressure: Sea level to 4,573 meters 15,000 feet above sea level;

c. Relative humidity: 5 to 95 percent;

d. Fungus: Components shall be constructed of nonfungus nutrient materials or shall be treated to inhibit fungus growth; and

e. Acoustical noise: Components shall be suitable for use in high noise areas above 100 dB, such as boiler rooms, power plants, and foundries without adversely affecting their performance.

2.5.5.2 Exterior Conditions

Components mounted in locations exposed to weather shall be housed in corrosion-resistant (per ASTM A 123/A 123M) enclosures with appropriate environmental protection. Component performance shall not degrade because of improper housing design. Components in enclosures shall meet performance requirements when exposed to the following ambient conditions:

a. Temperature: Minus 32 to 60 degrees C Minus 25 to 140 degrees F;

b. Pressure: Sea level to 4,573 meters 15,000 feet above sea level;

c. Solar radiation: Six hours of solar radiation at dry bulb temperature of 60 degrees C 120 degrees F including 4 hours of solar radiation at 0.00112 watts per square millimeter 104 watts per square foot;

d. Sand and dust: Wind driven for up to [9.6] [_____] km per hour 6 miles per hour;

e. Rain: 50 mm 2 inches per hour and 125 mm 5 inches per hour cyclic with wind plus one period of 300 mm 12 inches per hour;

f. Humidity: 5 to 95 percent;

g. Fungus: Warm, humid atmosphere conducive to the growth of heterotropic plants;

h. Salt fog: Salt atmosphere with 5 percent salinity;

i. Snow: Snow loading of 234 kg per square meter 48 pounds per square foot (psf) per hour; blowing snow of 22.5 kg per square meter 4.6 psf per hour;

j. Ice accretion: Up to 12.7 mm 1/2 inch of radial ice;

k. Wind: Up to 80 km/h 50 mph with gusts to 106 km/h 66 mph, except that fence sensors shall detect intrusions up to 56 km/h 35 mph; and

l. Acoustical noise: Components shall be suitable for use in high noise areas above 110 dB, such as flight lines, runup pads, and generator sites without adversely affecting their performance.

2.5.5.3 Lightning and Power Surges

Intrusion detection, video circuitry, and communication circuits that lead to the central alarm reporting and display unit shall be protected at both ends against excessive voltages. This requirement shall apply for circuits that are routed both in underground conduits and overhead runs. As a minimum, install primary detection devices, such as three electrode gas-type surge arresters, and secondary protectors to reduce dangerous voltages to levels that will cause no damage. Fuses shall not be permitted as protection devices. Provide fail-safe gas tube type surge arresters on exposed IDS data circuits. Breakdown voltage for the unit shall be 300 to 500 volts dc. Unit shall have equal performance for bipolar operation with automatic reset feature and a minimum life of 1000 surges with 10 times 1000 microsecond waveform at 1000 amperes. Provide low capacitance transient suppression type video lightning surge arresters on exposed video cables. Breakdown voltage for the unit shall be 7 to 9 volts at 10 milliamperes. Maximum clamping voltage shall be 15 volts at 130 amperes for one time 50-microsecond waveform. Minimum life shall be 1000 surges with one time, 50-microsecond waveform at 130 amperes. There shall be no degradation in video quality. Units shall be UL listed. Transient protection shall protect against spikes up to 1000 volts peak voltage with a one-microsecond rise time and 100-microsecond decay time, without causing false alarms. The protective device shall be automatic and self-restoring, and shall be on duty at all times. Circuits shall be designed or selected assuming a maximum of 25 ohms to ground.

2.5.6 Electromagnetic Interference (EMI)

IDS components employing electromagnetic radiation shall be designed and constructed to provide maximum practical invulnerability to electronic countermeasures.

2.5.7 Electromagnetic Radiation (EMR)

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NOTE: National Post Telephone and Telegraph is normally the approving authority for EMR components overseas.

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Provide only IDS components which are Federal Communication Commission (FCC) licensed and approved. Provide system components which are electromagnetically compatible.

2.5.8 Interchangeability

Like components shall be physically and functionally interchangeable as complete items, without modification of either the original items or of other components with which the items are used.

2.5.9 Safety

IDS components shall conform to applicable rules and requirements of NFPA 70 and relevant UL publications.

2.5.10 Computer Software

Software shall be comprised of computer programs and computer data bases as required. Software shall be categorized as mission software and support software.

2.5.10.1 Mission Software

Mission software shall consist of software implemented to provide complete operation of the IDS.

2.5.10.2 Support Software

Support software shall consist of software implemented to support system operation, such as system setup and off-line maintenance routines.

2.5.10.3 Software Performance Requirements

Provide software in modules to meet application requirements of this section. Software shall include the operating system (OS), be complete off-the-shelf, modifiable for specific IDS application specified herein, and be a product of and supported by the IDS central processor manufacturer. OS executive shall accomplish in real time the scheduling and sequencing of programs for execution. Each program shall be assigned a priority level. Provide priority levels in sufficient number to provide total functional operation as specified. Software shall be menu-driven. Menu, reconfiguration, and other actions which could in any way compromise the security and integrity of the IDS shall be password controlled. A minimum of eight password levels shall be provided. Software provided shall be documented in a user's manual which shall be approved by the Contractor prior to system implementation.

2.5.11 Test Points

Test points, controls, and other adjustments inside enclosures shall be readily visible and accessible with minimum disassembly of equipment. Test points and other maintenance controls shall not be readily accessible to operator personnel.

2.5.12 Component Enclosures

Consoles, annunciator housings, power supply enclosures, sensor control and terminal cabinets, control units, wiring gutters, and other component housings, collectively referred to as enclosures, shall be formed and assembled to be sturdy and rigid, and compliant with ANSI/EIA/TIA-232-E.

2.5.12.1 Metal Thickness

Thicknesses of metal in cast and sheet metal enclosures of all types shall be not less than those listed in Tables 8.1, 8.2, and 8.3 of UL 1610for alarm components, and NEMA ICS 2 and NEMA ICS 6 for other enclosures. Sheet steel used in fabrication of enclosures shall be not less than 16 gage, except consoles may be 18 gage.

2.5.12.2 Doors and Covers

Doors and covers shall be flanged. Where doors are mounted on hinges with exposed pins, the hinges shall be of the tight pin type, or the ends of hinge pins shall be tack welded to prevent ready removal. Provide doors having a latch edge length of less than 600 mm 24 inches with a single lock. Where latch edge of a hinged door is 600 mm 24 inches or more in length, provide the door with a three-point latching device with lock; or alternatively with two locks, one located near each end. Covers of junction boxes provided to facilitate initial installation of the system shall be held in place by tack welding, brazing, or one-way screws.

2.5.12.3 Ventilation

Ventilation openings in enclosures and cabinets shall conform to requirements of UL 1610.

2.5.12.4 Mounting

Unless otherwise indicated, sheet metal enclosures shall be designed for wall mounting with top hole slotted. Mounting holes shall be in positions which remain accessible when major operating components are in place and door is open, but shall be inaccessible when door is closed.

2.5.12.5 Labels

Labels shall be affixed to such boxes indicating they contain no connections. These labels shall not indicate that the box is part of the intrusion detection system.

2.5.12.6 Enclosure Locks

Locks and key-lock-operated switches required to be installed on component enclosures shall be UL listed.

PART 3 EXECUTION

3.1 EQUIPMENT INSTALLATION

UL 681, UL 1037, and UL 1076, and the appropriate installation manual for each equipment type. Components within the system shall be configured with appropriate "service points" to pinpoint system trouble in less than 20 minutes.

3.1.1 Cable and Wire Runs

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NOTE: Where design requirements must conform to NACSIM 5203, "Guidelines for Facility Design and RED/BLACK Installation," refer to Military Handbook MIL-HDBK-232.
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NFPA 70 and as specified herein. Conduits including flexible metal and armoured cable shall terminate in the sensor or device enclosure. Ends of conduit shall be fitted with insulated bushings. Exposed conductors at ends of conduits external to sensors and devices are not acceptable.

3.1.2 Soldering

ASTM B 32. For soldering electrical connections, use composition Sn60, Type AR or S, for general purposes; use composition Sn62 or Sn63, Type AR or S, for special purposes. When Type S solder is used for soldering electrical connections, flux shall conform to ASTM B 32.

3.1.3 Conduit

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NOTE: Where design requirements must conform to NACSIM 5203, "Guidelines for Facility Design and RED/BLACK Installation," refer to Military Handbook MIL-HDBK-232.
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Install in accordance with NFPA 70.

3.2 ADJUSTMENT, ALIGNMENT, SYNCHRONIZATION, AND CLEANING

Subsequent to installation, clean each system component of dust, dirt, grease, or oil incurred during installation or accrued subsequent to installation from other project activities, and prepared for system activation by manufacturer's recommended procedures for adjustment, alignment, or synchronization. Prepare each component in accordance with appropriate provisions of component installation, operations, and maintenance manuals. Remove large vegetation that may sway in the wind and touch fencing.

3.3 FIELD QUALITY CONTROL

3.3.1 IDS Operational Test

Test shall ensure that the requisite degree of intrusion detection is provided. Initially, test each sensor and subsystem component individually. When the function of each component within a particular subsystem such as each sensor within a particular zone is verified, certify that subsystem of the entire IDS as satisfactorily meeting required specifications. Test each subsystem similarly until each detection zone has been certified. When subsystem certification is complete, test entire integrated system to ensure that subsystem elements are compatible and function as a complete system. Integrated system test shall be accomplished in linear fashion, end-to-end, and shall verify that each simulated intrusion performed within each detection zone produces an appropriate alarm or signal. Integrated system test shall also verify that alarm is correctly annunciated at the central alarm reporting and display unit. Provide for approval, not later than 30 days prior to formal inspection and test, a detailed operational test plan of how each component, subsystem, and entire IDS will be tested. When tests are complete and corrections made, submit a signed and dated certificate with a request for formal inspection and tests.

3.3.2 Formal Inspection and Test

3.3.2.1 Final Inspection

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NOTE: For NORTHNAVFACENGCOM and other EFD's with a designated IDS engineer, select the first bracketed

option for all projects. In all other areas, select the second bracketed option for all projects.

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The Subcontract Administrator will witness formal tests after receipt of written certification that preliminary tests have been completed and that system is ready for final inspection. Repeat preliminary tests and functional and operational tests, conducted as requested by the Subcontract Administrator. Correct defects and conduct additional tests to demonstrate that system conforms to contract specifications.

3.3.2.2 IDS Final Test

Test each sensor within a detection zone and then test the entire zone in accordance with applicable test procedures in the test plan for sensors incorporated within that zone. As the test in that zone is proceeding, modifications or adjustments are prohibited. If, subsequent to the test, a modification or adjustment is necessary, retest the zone in the presence of the authorized representative of the Subcontract Administrator. Test other components individually within each subsystem. Component or subsystem failure shall require retesting after needed repairs or adjustments have been accomplished. For testing purposes, computers, data managers, graphic displays, control units gathering panels and nonsensor-related cabling will be considered part of the central alarm reporting and display console. The integrated system test shall commence only when subsystem tests have been completed. In the interest of efficiency, major elements in a subsystem may be tested even if corrections for minor elements have not been completed. Testing of minor elements will be accomplished upon completion. Only when subsystem elements have been tested can subsystem be certified as complete. When testing is complete, test procedure, together with data sheets, shall become the substance of the final acceptance report. The test report documents and verifies the Contractor's acceptance and approval of equipment and installation required by the contract.

-- End of Section --